

IN THE CLAIMS:

No new claims and no amendments; all claims are as Previously Presented.

1 1-9. (cancelled)

1 10. (previously presented) A method of processing in a network server,  
2 comprising the steps of:

3 receiving from a remote mobile client a representation of a geographical location,  
4 said representation being transmitted at least partially via a packet switched  
5 communication network at a transport layer or above by communicating with a first  
6 wireless network access point at a lower layer using a first air interface protocol;

7 sending to said remote mobile client an indication of a second air interface  
8 protocol and a set of parameters for use in accessing a second wireless network access  
9 point using said second air interface protocol; and

10 sending to said second wireless network access point an indication of said remote  
11 mobile client and a code requesting said second wireless network access point to provide  
12 wireless access to said remote mobile client;

13 wherein the server method is implemented to centrally manage a roaming  
14 operation for the remote mobile client and the remote mobile client can perform  
15 application layer, client-server interactions with a network application server when  
16 coupled to the first wireless network access point and later when coupled to the second  
17 wireless network access point.

1 11. (previously presented) The method of Claim 10 wherein said set of  
2 parameters comprises a software module defined to execute over a Java virtual machine,  
3 said software module defining at least a portion of a software layer of said second air  
4 interface.

1 12. (previously presented) The method of Claim 10, wherein said set of  
2 parameters comprises a software module, an executable software program is described as  
3 a resource in a resource description language, and the software module comprises a subset  
4 of submodules that are not already present in and need to be loaded into the remote  
5 mobile client in order to build the executable software program.

1 13. (previously presented) The method of Claim 10, further comprising:

2 selecting said second wireless network access point based on an optimization  
3 criterion that is a function of at least one user preference.

1 14. (previously presented) The method of Claim 10, further comprising:  
2 selecting said second wireless network access point from a pool of federated  
3 wireless access points supplied by registered associates, whereby said selection is based at  
4 least in part on said representation and an optimization criterion that is a function of at  
5 least one user preference.

1 15. (cancelled)

1 16. (previously presented) A method of selling federated wireless access  
2 services with the assistance of associates, the federated wireless access services accessible  
3 to users of a merchant web site system which provides services for allowing users to  
4 electronically lease wireless access connectivity, the method comprising:

5 enrolling a plurality of associates using an on-line registration system, whereby a  
6 respective one of said associates indicates an air interface protocol used by a wireless  
7 access point system supplied by said respective associate;

8 receiving from a remote mobile client a representation of a geographical location,  
9 said representation being transmitted using a first air interface protocol via a first wireless  
10 network access point;

11 at least partially in response to the representation, selecting a second wireless  
12 network access point to provide wireless access to the remote client;

13 sending to said remote client an indication of a second air interface protocol and a  
14 set of parameters for use in accessing the second wireless network access point using said  
15 second air interface protocol; and

16 sending to the second wireless network access point a code requesting said second  
17 wireless network access point to provide wireless access to said remote client.

1 17. (previously presented) The method of Claim 16 wherein said set of  
2 parameters comprises a software module defined to execute over a Java virtual machine,  
3 said software module defining at least a portion of a software layer of said second air  
4 interface.

1           18. (previously presented) The method of Claim 16, wherein said set of  
2 parameters comprises a software module, an executable software program is described as  
3 a resource in a resource description language, and the software module comprises a subset  
4 of submodules that are not already present in and need to be loaded into the remote  
5 mobile client in order to build the executable software program.

1           19. (previously presented) The method of Claim 16, further comprising:  
2 selecting said second wireless network access point based on an optimization  
3 criterion that is a function of at least one user preference.

1           20. (previously presented) The method of Claim 16, further comprising:  
2 maintaining a first financial record used for billing said remote mobile client; and  
3 maintaining a second financial record used for compensating the associate  
4 associated with said second wireless network access point.

1           21. (previously presented) For use in a system comprising a plurality of wireless  
2 network access points that are coupled via a packet switched data network to a remote  
3 roam-management server that is adapted to manage compatibility aspects of roaming  
4 operations of a wireless terminal apparatus as the wireless terminal apparatus changes  
5 geographical locations and roams from the coverage areas of different ones of the  
6 wireless access points that use different communication protocols, the wireless terminal  
7 apparatus comprising:  
8           a wireless transceiver adapted to communicate with a first network access point  
9 using a first air interface protocol;  
10           a software function that communicates partially via a wireless path using the first  
11 air interface protocol and partially via a path through the packet switched data network  
12 with a corresponding peer software function in a the remote roam-management server, the  
13 communication being performed at the transport layer or above;  
14           a programmable software radio processor adapted to implement at least one of a  
15 physical layer and a link layer of a second air interface protocol; and  
16           a software radio configuration module coupled to said transceiver;

17 wherein to implement handoffs to selected wireless access points supporting  
18 previously unknown air interface protocol features, said wireless terminal apparatus is  
19 configured to:

20 (i) perform a data transaction with said remote roam-management server to  
21 identify to said remote roam-management server a geographical location associated with  
22 said wireless terminal apparatus, and in response thereto, to obtain wirelessly at least one  
23 software module comprising program instructions and to pass said at least one software  
24 module to said software radio processor;

25 (ii) execute in said software radio processor said program instructions in said  
26 at least one software module, the program instructions being executed to implement at  
27 least a portion of the second air interface protocol in order support communication with a  
28 second wireless network access point that uses the second air interface protocol; and

29 (iii) perform a handoff operation to switch the transceiver from the first  
30 wireless network access point using the first air interface protocol to the second wireless  
31 network access point using the second air interface protocol, and to support  
32 communication with at least one remote network server at the transport layer or above  
33 using said first air interface protocol prior to the handoff and using said second air  
34 interface protocol subsequent to the handoff operation;

35 wherein the at least one software module is received from the remote roam-  
36 management server to allow the wireless terminal apparatus to dynamically roam onto a  
37 network that uses the second air interface protocol, wherein a complete set of program  
38 code used to implement the second air interface protocol was not present in the wireless  
39 terminal apparatus prior to the handoff operation.

1 22. (previously presented) The wireless terminal apparatus according to Claim  
2 21, wherein the program instructions wirelessly received in the at least one software  
3 module are in the native machine language of the software radio processor.

1 23. (previously presented) The wireless terminal apparatus according to Claim  
2 21, wherein the program instructions wirelessly received in the at least one software  
3 module are pre-compiled into the native machine language of the software radio  
4 processor before being executed.

1           24. (previously presented) For use in a system comprising a plurality of wireless  
2 network access points that are coupled via a packet switched data network to a remote  
3 roam-management server that is adapted to manage compatibility aspects of roaming  
4 operations of a wireless terminal apparatus as the wireless terminal apparatus changes  
5 geographical locations and roams from the coverage areas of different ones of the  
6 wireless access points that use different communication protocols, the wireless terminal  
7 apparatus comprising:

8           a wireless transceiver adapted to communicate with a first network access point  
9 using a first air interface protocol;

10           a software function that communicates partially via a wireless path using the first  
11 air interface protocol and partially via a path through the packet switched data network  
12 with a corresponding peer software function in a the remote roam-management server, the  
13 communication being performed at the transport layer or above;

14           a programmable software radio processor adapted to implement at least one of a  
15 physical layer and a link layer of a second air interface protocol; and

16           a software radio configuration module coupled to said transceiver;

17           wherein to implement handoffs to selected wireless access points supporting  
18 previously unknown air interface protocol features, said wireless terminal apparatus is  
19 configured to:

20           (i)     perform a data transaction with said remote roam- management server to  
21 identify to said remote roam-management server an indication of radio contact with a  
22 local wireless network access point, and in response thereto, to obtain wirelessly at least  
23 one software module comprising program instructions and to pass said at least one  
24 software module to said software radio processor;

25           (ii)    execute in said software radio processor said program instructions in said  
26 at least one software module to implement at least a portion of the second air interface  
27 protocol in order support communication with the local wireless network access point  
28 that uses the second air interface protocol; and

29           (iii)   perform a handoff operation to switch the transceiver from the first  
30 wireless network access point using the first air interface protocol to the local wireless

31 network access point using the second air interface protocol, and to support  
32 communication with at least one remote network server at the transport layer or above  
33 using said first air interface protocol prior to the handoff and using said second air  
34 interface protocol subsequent to the handoff operation;

35 wherein the software module is received from the remote roam-management  
36 server to allow the wireless terminal apparatus to dynamically roam onto a network that  
37 uses the second air interface protocol, wherein a complete set of program code used to  
38 implement the second air interface protocol was not present in the wireless terminal  
39 apparatus prior to the handoff operation.

1 25. (previously presented) The wireless terminal apparatus according to Claim  
2 24, wherein the program instructions wirelessly received in the at least one software  
3 module are in the native machine language of the software radio processor.

1 26. (previously presented) The wireless terminal apparatus according to Claim  
2 24, wherein the program instructions wirelessly received in the at least one software  
3 module are pre-compiled into the native machine language of the software radio  
4 processor before being executed.

1 27. (previously presented) A wireless terminal apparatus that is configured to  
2 roam from a first wireless access point that uses a first air interface protocol to a second  
3 wireless access point that uses a second air interface protocol, comprising:

4 at least one client-side application layer program that communicates with at least  
5 one remote roam-management server using an application layer protocol that layers over  
6 the first air interface protocol at a first time before a roam operation and over the second  
7 air interface protocol at a second time after the roam operation, wherein the roam  
8 operation is performed to switch wireless access from the first wireless access point to the  
9 second wireless access point;

10 a software radio configuration module that communicates with the remote roam  
11 management server, wherein the software radio configuration module is operative to  
12 report to the remote roam management server dynamic location-based information that  
13 indicates that the wireless terminal apparatus is in a locality of the second wireless access  
14 point, and when it is determined that the second wireless access point supports at least

15 one previously unknown air interface protocol feature and additional software should be  
16 downloaded to facilitate communication with the second wireless access point, to receive  
17 from the remote roam management server a second executable software module; and  
18 a software radio transceiver coupled to the software radio configuration module,  
19 wherein prior to the roam operation the software radio transceiver is operative to  
20 implement at least a portion of the first air interface protocol according to a first  
21 executable software module, and after the roam operation the software radio transceiver is  
22 operative to implement at least a portion of at least one of a physical layer and a link layer  
23 of the second air interface protocol according to the second executable software module,  
24 and wherein the roam-management server is a centralized network server that is  
25 geographically external to both the first and second wireless access points and the roam-  
26 management server manages compatibility aspects of network roaming as the wireless  
27 terminal apparatus roams to different ones of a plurality of wireless access points that use  
28 different communications protocols.

1 28. (previously presented) The apparatus according to Claim 27, wherein the  
2 software radio configuration module communicates with the remote roam management  
3 server via a communication management session at a layer above a transport layer in a  
4 communications protocol stack and the remote roam management server maintains a  
5 database record regarding the currently loaded software maintained in the wireless  
6 terminal apparatus.

1 29. (previously presented) The apparatus according to Claim 27, wherein said  
2 second executable software module is defined to execute over a Java virtual machine, and  
3 is translated into a more efficient execution language prior to execution.

1 30. (previously presented) The apparatus according to Claim 27, wherein said  
2 software radio configuration module makes use of a resource description language  
3 description to identify a set of executable software resources needed to implement a  
4 software radio program that implements at least a portion of a layer of an air interface  
5 protocol, and said software radio configuration module uses the resource description  
6 language description to identify a subset of one or more executable software modules that  
7 are not already present in the apparatus and that need to be loaded into the apparatus in

8 order to build the software radio program that implements the second air interface  
9 protocol.

1 31. (previously presented) The apparatus according to Claim 27, wherein the  
2 terminal apparatus is also configured to roam to a third wireless access point having a  
3 known air interface protocol without the need to download any new executable program  
4 instructions to execute on the software radio processor in order to complete the roam  
5 operation.

1 32. (previously presented) The apparatus according to Claim 27, wherein the  
2 first and second air interface protocols respectively correspond to an open road  
3 transceiver air interface protocol and a toll tag air interface protocol.

1 33. (previously presented) The apparatus according to Claim 21, wherein the  
2 terminal apparatus is also configured to roam to a third wireless access point having a  
3 known air interface protocol without the need to download any new executable program  
4 instructions to execute on the software radio transceiver in order to complete the roam  
5 operation.

1 34. (previously presented) The apparatus according to Claim 27, further  
2 comprising:

3 a global positioning system (GPS) receiver and a GPS processor, said GPS  
4 processor coupled to said GPS receiver;

5 wherein

6 (i) said GPS processor uses a set of GPS signals received via said GPS  
7 receiver to compute a representation of a geographical location;

8 (ii) said software radio transceiver transmits said representation to said remote  
9 roam management server; and

10 (iii) said remote roam management server uses said representation to identify  
11 the second air interface protocol.

1 35. (previously presented) The apparatus according to Claim 27, further  
2 comprising:

3 a local positioning system (LPS) receiver and a LPS processor, said LPS processor  
4 coupled to said LPS receiver;



5           wherein

6           (iii)   said LPS processor uses a set of LPS signals received via said LPS  
7                   receiver to compute a representation of a geographical location;

8           (iv)   said software radio transceiver transmits said representation to said remote  
9                   roam management server; and

10          (iii)   said remote roam management server uses said representation to identify  
11               the second air interface protocol.

1           36. (previously presented) The apparatus according to Claim 27, wherein the  
2               dynamic location- based information is indicative of a set of geographical coordinate  
3               information.

1           37. (previously presented) The apparatus according to Claim 27, wherein the  
2               dynamic location- based information is indicative having made radio contact with the  
3               second wireless access point.

1           38. (previously presented) The apparatus according to Claim 37, wherein the  
2               dynamic location- based information relates to the identity of the second wireless access  
3               point which has a fixed geographical location and a corresponding wireless coverage  
4               area.

1           39. (previously presented) The apparatus according to Claim 37, wherein the  
2               wireless terminal apparatus scans a set of one or more access channels to determine when  
3               it has made radio contact with the second wireless access point.

1           40. (previously presented) The apparatus according to Claim 27, wherein the  
2               first air interface protocol corresponds to a satellite communications air interface  
3               protocol, the second air interface protocol corresponds to a terrestrial cellular  
4               communications air interface protocol, and the roam operation is from a satellite overlay  
5               network to a terrestrial cellular communications network.

1           41. (previously presented) The apparatus according to Claim 27, wherein the  
2               first air interface protocol corresponds to a satellite communications air interface  
3               protocol, the second air interface protocol corresponds to a wireless local area network air  
4               interface protocol, and the roam operation is from a satellite overlay network to a wireless  
5               local area network access point.

1           40. (previously presented) The apparatus according to Claim 27, wherein the  
2 first air interface protocol corresponds to a terrestrial cellular communications air  
3 interface protocol, the second air interface protocol corresponds to a wireless local area  
4 network air interface protocol, and the roam operation is from a terrestrial cellular  
5 communications network to a wireless local area network access point.

1           42. (previously presented) The apparatus according to Claim 27, wherein said  
2 software radio configuration module makes use of a resource description language  
3 description to identify software resources resident in the wireless terminal apparatus, said  
4 software radio configuration module causes to be coupled at least a portion of the  
5 resource description language description to a remote software download server to enable  
6 the remote software download server to identify downloadable software resources that are  
7 not already resident in the wireless terminal apparatus and that are needed by the second  
8 executable software module for use in accessing the second wireless access point,  
9 whereby the coupling of the resource description language description allows the remote  
10 software download server to download to the wireless terminal apparatus only the  
11 downloadable software resources for the second executable software module that are not  
12 already resident in the wireless terminal apparatus.

1           43. (previously presented) The apparatus according to Claim 42, wherein the  
2 remote roam management server comprises the software download server, the roam  
3 management server maintains a client record indicative of a set of software modules  
4 currently resident in the wireless terminal apparatus, and the packet switched data  
5 network comprises at least a path through the global Internet.

6           44. (previously presented) The apparatus according to Claim 42, wherein:  
7 the downloadable software resources comprise a set of executable software  
8 submodules which collectively constitute the second executable software module, and  
9 the remote software download server uses push technology to push required ones  
10 of the set of executable software submodules of the second executable software module  
11 to the wireless terminal apparatus based upon identifying a subset of one or more of the  
12 set of executable software submodules that are not already resident in the wireless

13 terminal apparatus and that need to be downloaded into the wireless terminal apparatus  
14 for use in accessing the second wireless access point.

1 45. (previously presented) The apparatus according to Claim 27, wherein:  
2 the second executable software program is described according to a resource  
3 description language, and  
4 the second executable software module comprises a subset of executable  
5 submodules that are not already resident in and need to be downloaded into the wireless  
6 terminal apparatus in order to enable the wireless terminal apparatus to access the second  
7 wireless access point, the subset of executable submodules supplying at least one air  
8 interface protocol feature that was not previously available in the wireless terminal  
9 apparatus but which is supported by the second wireless access point.

1 46. (previously presented) The apparatus according to Claim 27, wherein the  
2 second wireless access point is selected based on an optimization criterion.

1 47. (previously presented) The apparatus according to Claim 46, wherein the  
2 optimization criterion is a function of at least one user preference.

1 48. (previously presented) The apparatus according to Claim 27, wherein the  
2 software radio configuration module communicates with the remote roam management  
3 server via a communication management session at a transport layer in a communications  
4 protocol stack.

1 49. (previously presented) The apparatus according to Claim 21, wherein the  
2 geographical location is identified in terms of a set of GPS coordinates and the packet  
3 switched data network comprises at least a portion of the Internet.

1 50. (previously presented) The apparatus according to Claim 21, wherein the  
2 first air interface protocol corresponds to a satellite communications air interface  
3 protocol, the second air interface protocol corresponds to a cellular communications air  
4 interface protocol, and the roam operation is from a satellite overlay network to a  
5 terrestrial cellular communications network.

1 51. (previously presented) The apparatus according to Claim 21, wherein the  
2 first air interface protocol corresponds to a satellite communications air interface  
3 protocol, the second air interface protocol corresponds to a wireless local area network air

4 interface protocol, and the roam operation is from a satellite overlay network to a wireless  
5 local area network access point.

1 52. (previously presented) The apparatus according to Claim 21, wherein the  
2 first air interface protocol corresponds to a terrestrial cellular communications air  
3 interface protocol, the second air interface protocol corresponds to a wireless local area  
4 network air interface protocol, and the roam operation is from a terrestrial cellular  
5 communications network to a wireless local area network access point.

1 53. (previously presented) The apparatus according to Claim 21, wherein said  
2 software radio configuration module makes use of a resource description language  
3 description to identify software resources resident in the wireless terminal apparatus, said  
4 software radio configuration module causes to be coupled at least a portion of the  
5 resource description language description to a remote software download server to enable  
6 the remote software download server to identify downloadable software resources that are  
7 not already resident in the wireless terminal apparatus and that are needed by the second  
8 executable software module for use in accessing the second wireless access point,  
9 whereby the coupling of the resource description language description allows the remote  
10 software download server to download to the wireless terminal apparatus only the  
11 downloadable software resources for the second executable software module that are not  
12 already resident in the wireless terminal apparatus.

1 54. (previously presented) The apparatus according to Claim 53, wherein the  
2 remote software download server comprises a portion of the remote roam management  
3 server and the remote roam management server maintains a database record regarding the  
4 currently loaded software maintained in the wireless terminal apparatus.

1 55. (previously presented) The apparatus according to Claim 53, wherein:  
2 the downloadable software resources comprise a set of executable software  
3 submodules which collectively constitute the second executable software module, and  
4 the remote software download server uses push technology to push required ones  
5 of the set of executable software submodules of the second executable software module  
6 to the wireless terminal apparatus based upon identifying a subset of one or more of the  
7 set of executable software submodules that are not already resident in the wireless

8 terminal apparatus and that need to be downloaded into the wireless terminal apparatus  
9 for use in accessing the second wireless access point.

1 56. (previously presented) The apparatus according to Claim 21, wherein the  
2 complete set of program code used to implement the second air interface protocol  
3 includes at least one downloadable software sub-module that implements at least a  
4 protocol feature of the second air interface protocol that is available to the second  
5 wireless access point but not available to the wireless terminal apparatus prior to the  
6 downloadable software sub-module being downloaded thereto.

1 57. (previously presented) The apparatus according to Claim 21, wherein the  
2 second wireless access point is selected based on an optimization criterion.

1 58. (previously presented) The apparatus according to Claim 57, wherein the  
2 optimization criterion is a function of at least one user preference.

1 59. (previously presented) The apparatus according to Claim 24, wherein the  
2 wireless terminal apparatus scans a set of one or more radio access channels to determine  
3 when it has made radio contact with the second wireless access point.

1 60. (previously presented) The apparatus according to Claim 24, wherein the  
2 first air interface protocol corresponds to a satellite communications air interface  
3 protocol, the second air interface protocol corresponds to a cellular communications air  
4 interface protocol, and the roam operation is from a satellite overlay network to a  
5 terrestrial cellular communications network.

1 61. (previously presented) The apparatus according to Claim 24, wherein the  
2 first air interface protocol corresponds to a satellite communications air interface  
3 protocol, the second air interface protocol corresponds to a wireless local area network air  
4 interface protocol, and the roam operation is from a satellite overlay network to a wireless  
5 local area network access point.

1 62. (previously presented) The apparatus according to Claim 24, wherein the  
2 first air interface protocol corresponds to a terrestrial cellular communications air  
3 interface protocol, the second air interface protocol corresponds to a wireless local area  
4 network air interface protocol, and the roam operation is from a terrestrial cellular  
5 communications network to a wireless local area network access point.

1           63. (previously presented) The apparatus according to Claim 24, wherein said  
2 software radio configuration module makes use of a resource description language  
3 description to identify software resources resident in the wireless terminal apparatus, said  
4 software radio configuration module causes to be coupled at least a portion of the  
5 resource description language description to a remote software download server to enable  
6 the remote software download server to identify downloadable software resources that are  
7 not already resident in the wireless terminal apparatus and that are needed by the second  
8 executable software module for use in accessing the second wireless access point,  
9 whereby the coupling of the resource description language description allows the remote  
10 software download server to download to the wireless terminal apparatus only the  
11 downloadable software resources for the second executable software module that are not  
12 already resident in the wireless terminal apparatus..

1           64. (previously presented) The apparatus according to Claim 63, wherein the  
2 remote roam management server comprises the software download server, the roam  
3 management server maintains a client record indicative of a set of software modules  
4 currently resident in the wireless terminal apparatus, and the packet switched data  
5 network comprises at least a path through the global Internet.

1           65. (previously presented) The apparatus according to Claim 63, wherein:  
2 the downloadable software resources comprise a set of executable software  
3 submodules which collectively constitute the second executable software module, and  
4 the remote software download server uses push technology to push required ones  
5 of the set of executable software submodules of the second executable software module  
6 to the wireless terminal apparatus based upon identifying a subset of one or more of the  
7 set of executable software submodules that are not already resident in the wireless  
8 terminal apparatus and that need to be downloaded into the wireless terminal apparatus  
9 for use in accessing the second wireless access point.

1           65. (previously presented) The apparatus according to Claim 62, wherein the  
2 complete set of program code used to implement the second air interface protocol  
3 includes at least one downloadable software sub-module that implements at least a  
4 protocol feature of the second air interface protocol that is available to the second

5 wireless access point but not available to the wireless terminal apparatus prior to the  
6 downloadable software sub-module being downloaded thereto.

1 66. (previously presented) The apparatus according to Claim 24, wherein the  
2 second wireless access point is selected based on an optimization criterion.

1 67. (previously presented) The apparatus according to Claim 66, wherein the  
2 optimization criterion is a function of at least one user preference.

1 68. (previously presented) The method according to Claim 10, wherein the set of  
2 parameters comprises at least one executable program instruction.

1 69. (previously presented) The method according to Claim 10, wherein the set of  
2 parameters comprises at least one executable program instruction to be executed by a  
3 software radio processor located in the remote mobile client.

1 70. (previously presented) The method according to Claim 16, wherein the set of  
2 parameters comprises at least one executable program instruction.

1 71. (previously presented) The method according to Claim 16, wherein the set of  
2 parameters comprises at least one executable program instruction to be executed by a  
3 software radio processor located in the remote mobile client.

1 72. (previously presented) The apparatus according to Claim 16, wherein the  
2 respective one of the associates indicates the air interface protocol during enrollment by  
3 entering data into a web page supplied by the merchant web site.

1 73. (previously presented) The apparatus according to Claim 24, wherein the  
2 wireless terminal apparatus is also configured to roam to a third wireless access point  
3 having a known air interface protocol without the need to download any new executable  
4 program instructions to execute on the software radio processor in order to complete the  
5 roam operation.

1